Claims:

Fig 8-9

1.   A method of clamping the output values of filtered image data comprising a mapping of discrete sample values, said method comprising the steps of:

     5   for each discrete sample value of said mapping:

           determining a maximum sample value and a minimum sample value of a plurality of input discrete samples values used to calculate said discrete sample value; and

           clamping the output value of said discrete sample value to the domain of said plurality of input discrete sample values utilising said maximum sample value and said

   10   minimum sample value, wherein said output value is dependent on a plurality of attributes of said plurality of input discrete sample values.

2.   The method according to claim 1, wherein said plurality of attributes includes a number representing the total number of colours represented by said plurality of input

   15   discrete sample values.

3.   The method according to claim 2, wherein said number is compared to a threshold value.

   20   4.   The method according to claim 3, wherein said threshold is predetermined.

          5.   The method according to claim 3, wherein said threshold is dependent on said plurality of input discrete sample values.

   25   6.   The method according to claim 3, wherein said threshold value is 8.

          7.   The method according to claim 1, wherein said plurality of attributes includes a magnitude of said discrete sample value.

   30   8.   The method according to claim 7, wherein said magnitude is compared to said maximum sample value and said minimum sample value.

9.   A method of interpolating image data comprising a plurality of discrete sample values, said method comprising the steps of:

accessing at least one portion of said discrete sample values of said image data;

calculating kernel values for each discrete sample value of said portion using one

5   of a plurality of kernels;

convolving said kernel values with said portion of discrete sample values to produce an output value; and

clamping said output value to the domain of said portion of discrete sample values, wherein said output value is dependent on a plurality of attributes of said portion

10   of discrete sample values.

10.   The method according to claim 9, wherein said plurality of attributes includes a number representing the total number of colours represented by said plurality of input discrete sample values.

15

11.   The method according to claim 10, wherein said number is compared to a threshold value.

12.   The method according to claim 11, wherein said threshold is predetermined.

20

13.   The method according to claim 11, wherein said threshold is dependent on said plurality of input discrete sample values.

14.   The method according to claim 11, wherein said threshold value is 8.

25

15.   The method according to claim 9, wherein said plurality of attributes includes a magnitude of said discrete sample value.

16.   The method according to claim 15, wherein said magnitude is compared to a

30   maximum sample value and a minimum sample value of said portion of discrete sample values.

17.   The method according to claim 16, wherein said output value is set to said maximum sample value if:

~~said number is less than said threshold value; and~~

said output value is greater than said maximum sample value of said portion.

18.   The method according to claim 8, wherein said output value is set to said minimum
5   sample value if:

said number is less than said threshold value; and

said output value is less than said minimum sample value of said portion.

19.   The method according to claim 16, wherein said maximum sample value and said
10   minimum sample value are calculated over all colour channels of said image data.

20.   An apparatus for clamping the output values of filtered image data comprising a
mapping of discrete sample values, said apparatus comprising:

means for determining for each discrete sample value of said mapping, a maximum
15   sample value and a minimum sample value of a plurality of input discrete samples values
used to calculate said discrete sample value; and

means for clamping the output value of said discrete sample value to the domain
of said plurality of input discrete sample values utilising said maximum sample value and
said minimum sample value, wherein said output value is dependent on a plurality of
20   attributes of said plurality of input discrete sample values.

21.   The apparatus according to claim 20, wherein said plurality of attributes includes a
number representing the total number of colours represented by said plurality of input
discrete sample values.

22.   ~~The apparatus according to claim 21, wherein said number is compared to a~~
~~threshold value.~~

23.   The apparatus according to claim 22, wherein said threshold is predetermined.
30

24.   The apparatus according to claim 22, wherein said threshold is dependent on said
plurality of input discrete sample values.

25.   The apparatus according to claim 22, wherein said threshold value is 8.

26.   The apparatus according to claim 20, wherein said plurality of attributes includes a magnitude of said discrete sample value.

5   27.   The apparatus according to claim 26, wherein said magnitude is compared to said maximum sample value and said minimum sample value.

28.   An apparatus for interpolating image data comprising a plurality of discrete sample values, said apparatus comprising:

10   access means for accessing at least one portion of said discrete sample values of said image data;

calculation means for calculating kernel values for each discrete sample value of said portion using one of a plurality of kernels;

convolution means for convolving said kernel values with said portion of

15   discrete sample values to produce an output value; and

clamp means for clamping said output value to the domain of said portion of discrete sample values, wherein said output value is dependent on a plurality of attributes of said portion of discrete sample values.

20   29.   The apparatus according to claim 28, wherein said plurality of attributes includes a number representing the total number of colours represented by said plurality of input discrete sample values.

30.   The apparatus according to claim 29, wherein said number is compared to a

25   threshold value.

31.   The apparatus according to claim 30, wherein said threshold is predetermined.

32.   The apparatus according to claim 30, wherein said threshold is dependent on said

30   plurality of input discrete sample values.

33.   The apparatus according to claim 30, wherein said threshold value is 8.

34.   The apparatus according to claim 28, wherein said plurality of attributes includes a magnitude of said discrete sample value.

35.   The apparatus according to claim 34, wherein said magnitude is compared to a maximum sample value and a minimum sample value of said portion of discrete sample values.

36.   The apparatus according to claim 35, wherein said output value is set to said maximum sample value if:

said number is less than said threshold value; and

said output value is greater than said maximum sample value of said portion.

37.   The apparatus according to claim 27, wherein said output value is set to said minimum sample value if:

said number is less than said threshold value; and

said output value is less than said minimum sample value of said portion.

38.   The apparatus according to claim 35, wherein said maximum sample value and said minimum sample value are calculated over all colour channels of said image data.

39.   A computer readable medium, having a program recorded thereon, where the program is configured to make a computer execute a procedure to clamp the output values of filtered image data comprising a mapping of discrete sample values, said program comprising:

code for determining for each discrete sample value of said mapping, a maximum sample value and a minimum sample value of a plurality of input discrete samples values used to calculate said discrete sample value; and

code for clamping the output value of said discrete sample value to the domain of said plurality of input discrete sample values utilising said maximum sample value and said minimum sample value, wherein said output value is dependent on a plurality of attributes of said plurality of input discrete sample values.

40.   The computer readable medium according to claim 39, wherein said plurality of attributes includes a number representing the total number of colours represented by said plurality of input discrete sample values.

5   41.   The computer readable medium according to claim 40, wherein said number is compared to a threshold value.

42.   The computer readable medium according to claim 41, wherein said threshold is predetermined.

10

43.   The computer readable medium according to claim 41, wherein said threshold is dependent on said plurality of input discrete sample values.

44.   The computer readable medium according to claim 41, wherein said threshold value
15   is 8.

45.   The computer readable medium according to claim 39, wherein said plurality of attributes includes a magnitude of said discrete sample value.

20   46.   The computer readable medium according to claim 45, wherein said magnitude is compared to said maximum sample value and said minimum sample value.

47.   A computer readable medium, having a program recorded thereon, where the program is configured to make a computer execute a procedure to interpolate image data
25   comprising a plurality of discrete sample values, said program comprising:

        code for accessing at least one portion of said discrete sample values of said image data;

        code for calculating kernel values for each discrete sample value of said portion using one of a plurality of kernels;

30   code for convolving said kernel values with said portion of discrete sample values to produce an output value; and

        code for clamping said output value to the domain of said portion of discrete sample values, wherein said output value is dependent on a plurality of attributes of said portion of discrete sample values.

48.   The computer readable medium according to claim 47, wherein said plurality of attributes includes a number representing the total number of colours represented by said plurality of input discrete sample values.

5

~~49.   The computer readable medium according to claim 48, wherein said number is compared to a threshold value.~~

50.   The computer readable medium according to claim 49, wherein said threshold is

10   predetermined.

51.   The computer readable medium according to claim 49, wherein said threshold is dependent on said plurality of input discrete sample values.

15   52.   The computer readable medium according to claim 49, wherein said threshold value is 8.

53.   The computer readable medium according to claim 47, wherein said plurality of attributes includes a magnitude of said discrete sample value.

20

54.   The computer readable medium according to claim 53, wherein said magnitude is compared to a maximum sample value and a minimum sample value of said portion of discrete sample values.

25   55.   The computer readable medium according to claim 54, wherein said output value is set to said maximum sample value if:
        said number is less than said threshold value; and
        said output value is greater than said maximum sample value of said portion.

30   56.   The computer readable medium according to claim 46, wherein said output value is set to said minimum sample value if:
        said number ~~is less than~~ said threshold value; and
        said output value is less than said minimum sample value of said portion.

57.   The computer readable medium according to claim 54, wherein said maximum sample value and said minimum sample value are calculated over all colour channels of said image data.

5